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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,143	10/27/2003	Huitao Luo	200310055-1	3278
22879	7590	11/01/2007		
HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			EXAMINER CARTER, AARON W	
			ART UNIT	PAPER NUMBER
			2624	
			MAIL DATE	DELIVERY MODE
			11/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/694,143

Applicant(s)

LUO, HUITAO

Examiner

Aaron W. Carter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-37 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This action is responsive to papers filed on August 2, 2007.

#### ***Response to Amendment***

2. In response to applicant's amendment received on August 2, 2007, all requested changes to the claims have been entered. Claim 37 has been added.

#### ***Declaration under 1.132***

3. The declaration under 37 CFR 1.132 filed August 2, 2007 is sufficient to overcome the rejection of claims 1-36 based upon USPN 7,068,841 to Luo.

#### ***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d

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1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

5. Claim 32 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 32 defines a “machine-readable medium storing machine readable instructions” embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., “When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized” – Guidelines Annex IV). The examiner suggests amending the claim to embody the program on “computer-readable medium” or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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7. Claims 1, 3-18, 20-33 and 35-37 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 6,285,797 to Lubin et al. ("Lubin") (already of record).

As to claim 1, Lubin discloses a method of assessing image quality, comprising:

Detecting a target object region in an input image (*Fig. 3, element 302, wherein the signal and distortion estimation generators detect target object regions relating to a video signal or distortion*);

Generating an image quality feature vector representing the target object region in an image quality feature space (*Fig. 3, element 326, wherein the virtual test is a combination of the feature vectors for target object regions determined in the signal and distortion estimation generator*); and

Mapping the image quality feature vector to a measure of image quality (*Fig. 3, element 332 and column 7, lines 11-15*).

As to claim 3, Lubin discloses the method of claim 1, wherein the target object region corresponds to an object relevant to a person's subjective assessment of image quality (*column 4, lines 45-49*).

As to claim 4, Lubin discloses the method of claim 1, wherein the target object region is detected based on a sub-sampled version of the input image (*column 4, lines 19-44*).

As to claim 5, Lubin discloses the method of claim 4, wherein the image quality feature vector is generated based on a version of the target object region at a resolution of the input image (*column 3, lines 42-64*).

As to claim 6, Lubin discloses the method of claim 1, wherein the detecting comprises detecting the target object region based on a first set of features of the input image, and the generating comprises generating the image quality feature vector based on a second set of features of the input image different from the first set of features (*Fig. 3, elements 304, 306 and 326, wherein each estimator detects target object regions based on different features of the image and the generation of the image quality feature vector is based on the combination the features used in the estimators corresponding to a second different set of features*).

As to claim 7, Lubin discloses the method of claim 6, wherein the first set of features is substantially decoupled from the second set of features (*Fig. 3, elements 304, 306 and 326*).

As to claim 8, Lubin discloses the method of claim 1, wherein the image quality feature space is spanned by multiple features including at least one brightness feature describing a respective brightness characteristic of the target object region (*column 4, lines 56-67*).

As to claim 9, Lubin discloses the method of claim 1, wherein the image quality feature space is spanned by multiple features including at least one spectral feature describing a respective spatial frequency characteristic of the target object region (*column 4, lines 56-67*).

As to claim 10, Lubin discloses the method of claim 9, wherein generating the image quality feature vector comprises decomposing the target object region into multiple wavelet transform sub-bands (*column 4, lines 56-67*).

As to claim 11, Lubin discloses the method of claim 10, wherein each spectral feature describes energy in a respective wavelet transform sub-band (*column 4, lines 56-67*).

As to claim 12, Lubin discloses the method of claim 1, wherein the image quality feature space is spanned by multiple features including at least one noise feature describing a respective noise characteristic of the target object region (*column 4, lines 56-67*).

As to claim 13, Lubin discloses the method of claim 12, wherein a noise feature is computed based on a measure of noise in the target object region (*column 4, lines 56-67*).

As to claim 14, Lubin discloses the method of claim 12, wherein a noise feature is computed based on a measure of spatial homogeneity of spectral features each describing a respective spatial frequency characteristic of the target image region (*column 4, lines 56-67*).

As to claim 15, Lubin discloses the method of claim 1, wherein the image quality feature vector is mapped to a measure of image quality in accordance with a machine learning process (*column 3, lines 11-19 and column 7, lines 11-34*).

As to claim 16, Lubin discloses the method of claim 15, wherein the image quality feature vector is mapped to a measure of image quality in accordance with a radial basis function based machine learning process (*column 3, lines 11-19 and column 7, lines 11-34*).

As to claim 17, Lubin discloses the method of claim 15, wherein the image quality feature vector is mapped to a measure of image quality in accordance with a mixture of Gaussian based machine learning process (*column 3, lines 11-19 and column 7, lines 11-34*).

As to claim 18, please refer to the rejection of claim 1 above.

As to claim 20, please refer to the rejection of claim 4 above.

As to claim 21, please refer to the rejection of claim 8 above.

As to claim 22, please refer to the rejection of claim 9 above.

As to claim 23, please refer to the rejection of claim 10 above.

As to claim 24, please refer to the rejection of claim 11 above.

As to claim 25, please refer to the rejection of claim 12 above.

As to claim 26, please refer to the rejection of claim 13 above.

As to claim 27, please refer to the rejection of claim 14 above.

As to claim 28, please refer to the rejection of claim 15 above.

As to claim 29, please refer to the rejection of claim 16 above.

As to claim 30, please refer to the rejection of claim 17 above.

As to claim 31, please refer to the rejection of claim 1 above.



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As to claim 32, please refer to the rejection of claim 1 above.

As to claim 33, please refer to the rejection of claim 1 above.

As to claim 35, please refer to the rejection of claim 8 above.

As to claim 36, please refer to the rejection of claim 9 above.

As to claim 37, Lubin discloses the system of claim 18, further comprising a computer-readable storage medium and a computer processor (*column 3, lines 20-36*).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2, 19 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lubin.

As to claims 2, Lubin discloses the method of claim 1, however, does not explicitly disclose wherein the target object region corresponds to a human face. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the method disclosed by Lubin with a target object region that corresponds to a human face.

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Therefore the Examiner takes Official Notice that the target object region disclosed by Lubin could have easily been a human face, as claimed.

As to claim 19, please refer to the rejection of claim 2 above.

As to claim 34, please refer to the rejection of claim 2 above.

### *Conclusion*

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

USPN 6,556,196 to Blanz et al. discloses a process of assessing image quality.

USPN 6,798,919 to Ali et al. discloses a process of assessing image quality.

USPN 6,992,697 to Ali discloses a process of assessing image quality.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron W. Carter whose telephone number is (571) 272-7445. The examiner can normally be reached on 8am - 4:30 am (Mon. - Fri.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Aaron Carter  
AU 2624